Mechanics of Settlement on Ripple: A Closer Look

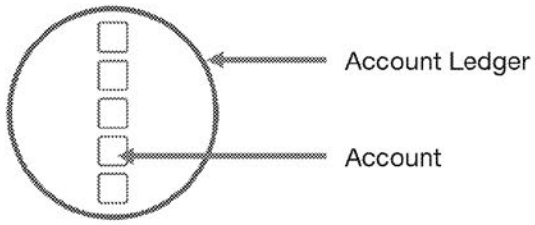
Walking Through the Mechanics of the Ripple Protocol

This section takes a deeper dive into the mechanics of the Ripple Protocol, highlighting the key features of the technology described above. The following series of illustrations depicts how a typical international transaction would flow through the network in three general steps.

Step 1. Before the Transaction

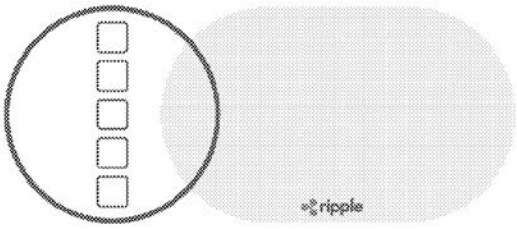
The hypothetical parties to this transaction include a U.S. Sender (consumer or business), European receiver (consumer or business), U.S. Bank (i.e. where the U.S. Sender has an account), Europe Bank (i.e. where the European Receiver has an account) and market makers (which provide liquidity for currency conversion, including EUR/USD).

The following diagram depicts an account ledger (i.e. the bank's core system), and each square represents an account within the bank's ledger (e.g. the checking account of U.S. Sender).



Each bank plugs into Ripple by downloading the open-source software and communicates balances to the network via an application-programming interface (API). In the pictures below, the Ripple network is illustrated by a blue oval. As the diagram shows, U.S. Bank's account ledger is integrated into the Ripple Network.

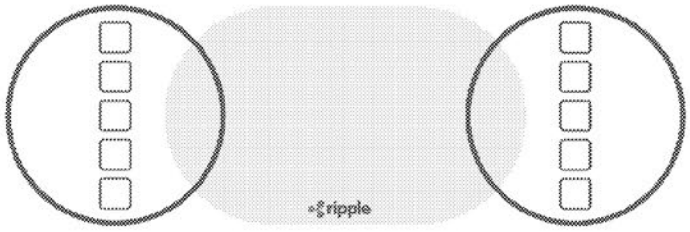
Integration involves synchronizing the two ledgers, so that the issuance of a balance in Ripple results in a debit in the core system, and vice versa, so that there is never a duplication of balances.



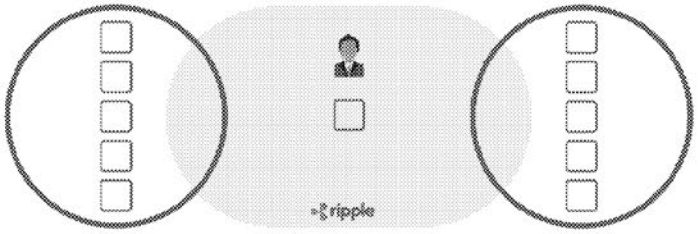
Multiple banks that are connected to Ripple then establish correspondent agreements either bilaterally or through clusters in order to transact on a peer-to-peer basis. The diagram on the following page shows that both U.S. Bank and European Bank are now integrated into Ripple and communicate balances into the network.

A bilateral or group agreement is typically necessary to provide for KYC information sharing to comply with funds "Travel" regulations and to provide for things like reversibility in the event of an erroneous payment.

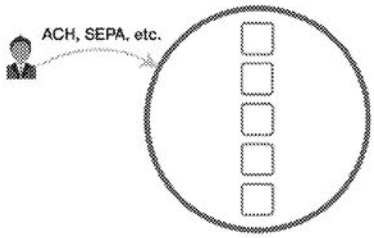
Mechanics of Settlement on Ripple: A Closer Look



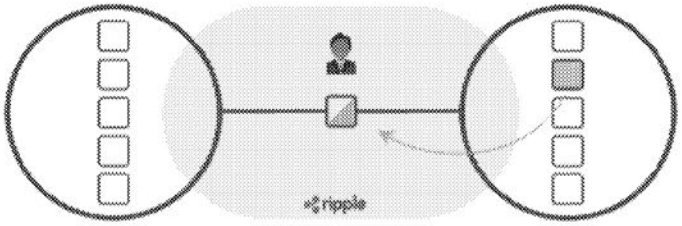
A market maker (typically a hedge fund or FX trading desk) sets up an account with both banks to provide liquidity in the system. Banks can vet, authorize, and in some cases, contract with the market maker directly.



Ripple is a pre-funded network. As shown in the diagram below, the market maker pre-funds his account by sending euros to the receiving bank (European Bank). This is done through the domestic payments systems (i.e. ACH, SEPA, etc…)

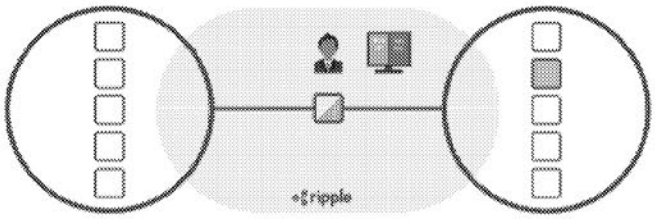


European Bank then immobilizes the cash and issues EUR to the market maker's account in Ripple. European Bank now has posted a liability (i.e. a balance) onto the Ripple ledger. This is depicted by the partially yellow shaded box within the Ripple Network below. This liability is backed by the EUR assets that the market maker pre-funded, which are now held by the bank in an immobilized account.



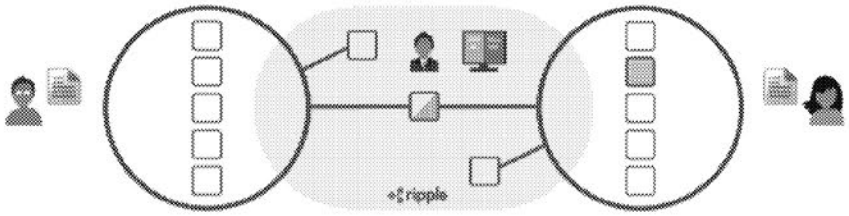
Mechanics of Settlement on Ripple: A Closer Look

The market maker can now post an offer to Ripple's order book, signaling to the market the rate where he is willing to sell his claim on Euros in order to buy U.S. Dollars.



Now we introduce two customers who wish to transact. As illustrated below, the U.S. Sender and European Receiver are customers of U.S. Bank and Europe Bank, respectively. Each customer is subject to their banks' know-your-customer (KYC) rules, transaction rules, etc.

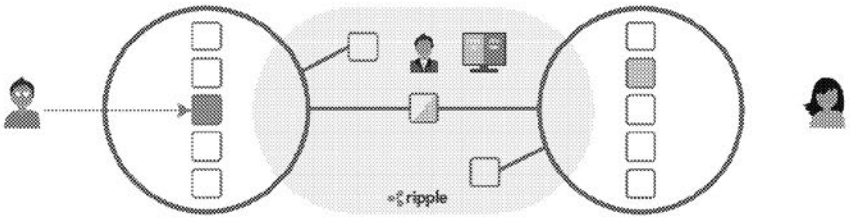
Each bank, further, has a single house account within Ripple which its customers access by proxy. This is analogous to how a customer would access ACH/SWIFT by proxy through his bank.



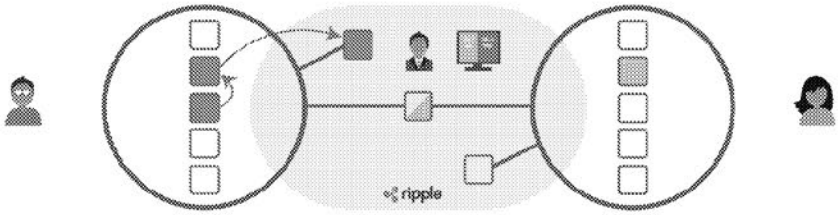
Mechanics of Settlement on Ripple: A Closer Look

Step 2: The Transaction Flow

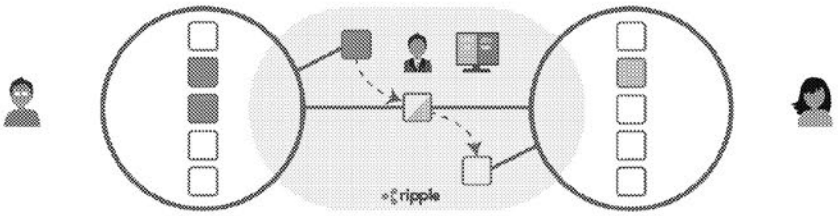
The U.S. Sender initiates the transaction by notifying his bank (U.S. Bank) that he would like to send cash to European Receiver. In the diagram below, the U.S. Sender's account is denoted by the green square and the European Receiver's account is depicted by the blank square in the center of EU Bank's ledger.



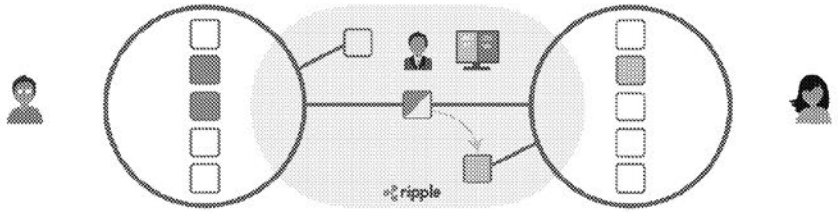
In the diagram below, U.S. Bank immobilizes the USD funds by transferring them to a house account and issues a USD balance into its Ripple account. This is illustrated in the diagram below by the green-shaded square interaction.



U.S. Bank can then query Ripple for the best rate to perform the transaction. Ripple automatically calculates the best execution path to trade between U.S. dollars and euros. The transaction is ultimately routed to the market maker with the most competitive offer in EUR/USD.

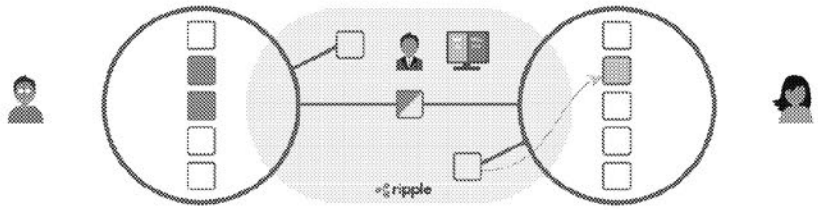


When the payment is sent, the market maker purchases USD from U.S. Bank, and Ripple simultaneously transfers EUR into Europe Bank's Ripple account. It is important to emphasize that neither bank has any counterparty risk to the market maker at any point in time, since both legs of the transaction are fulfilled simultaneously.

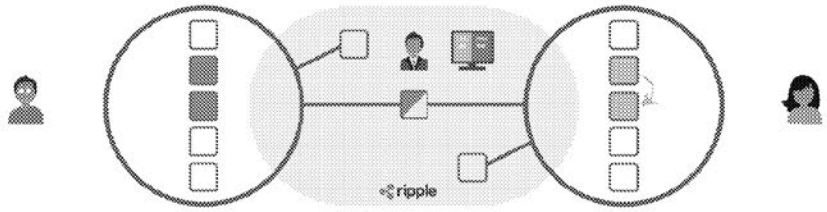


Mechanics of Settlement on Ripple: A Closer Look

The European Bank debits this Ripple Balance to gain access to the funds. This is depicted by the yellow arrow and square in the diagram below.



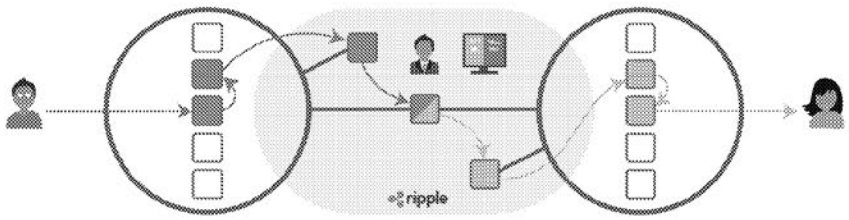
Finally, European Bank transfers EUR from the immobilized holding account into European Receiver's beneficiary account (i.e. the receiver's checking account) held in the institution.



All told, the process essentially boils down to two in-house transfers: 1) a transfer of USD from the sender to the market maker at U.S. Bank and 2) an offsetting transfer of EUR from the market maker to the recipient at Europe Bank.

Straight-Through Transaction Settlement

The walkthrough above highlights how innovative the technology is for interbank transaction settlement. Once integrated into the protocol, any two banks located anywhere in the world can transact directly on a real-time basis. This entire process takes place in six seconds as the banks transact on a peer-to-peer basis rather than through several hops (as in correspondent banking) or through multiple currency conversions (as required by other digital currency protocols).



Correspondent Banking: a Closer Look

A Closer Look at Correspondent Banking

Today, each country has its own domestic interbank transfers system, such as the ACH System in the U.S. or the Bankers' Automated Clearing Services (BACS) in the UK. At the core, these payment systems enable domestic bank-to-bank transfers and are typically low-cost transactions for businesses and banks, but could take two to five days to settle. *For international transactions, however, there is no global ACH or payment rail.* Instead, money moves from bank to bank through a series of correspondent banking relationships, which act like a bridge from one regional banking center to another.

These correspondent banking relationships are bilateral agreements between financial institutions. Correspondent banking networks could become quite extensive, with larger financial institutions managing hundreds of bilateral arrangements. Correspondent banks act as a domestic agent's bank in international markets and could process transactions, accept deposits or conduct other business activities on behalf of domestic banks. For example, a small or mid-sized U.S. bank could transact with a European bank through a bilateral relationship with a large U.S. bank, which in turn could have a bilateral relationship with a large European bank.

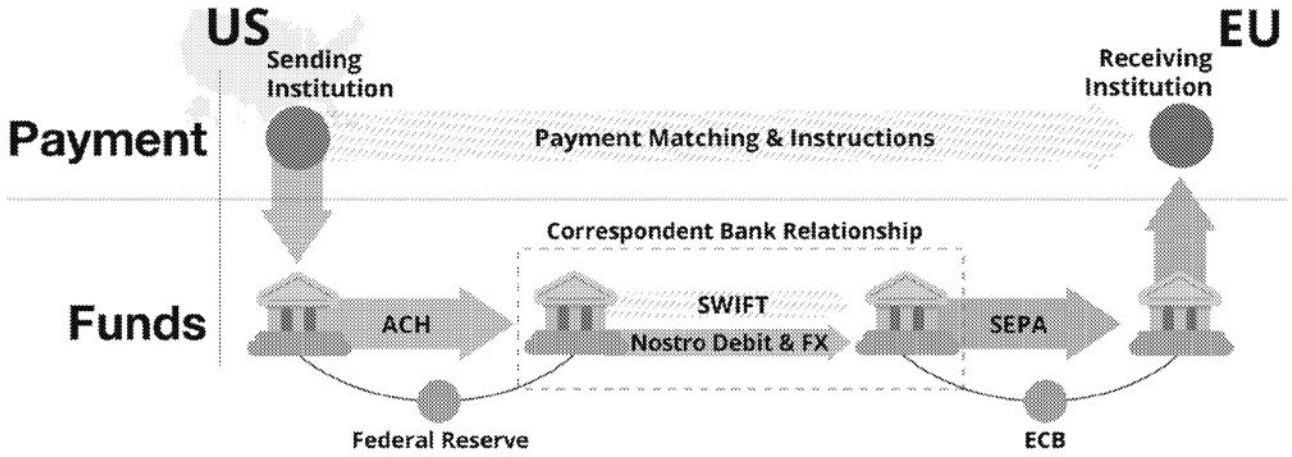
Correspondent banks typically have correspondent accounts (also known as nostro accounts) with foreign banks that have the ability to pay and receive in the domestic currency. For example, a large U.S. Bank might have a correspondent account with a large UK Bank, which can transact in British pounds. The correspondent account allows the U.S. bank to offer various services to domestic customers, including foreign exchange or foreign denominated deposits without a bank license in the foreign country.

These correspondent banks, moreover, decide on how and when to settle transactions between them using their correspondent accounts. For example, two correspondent banks with correspondent accounts could decide to settle transactions daily on a net basis. The banks simply deposit and withdraw funds from their correspondent accounts.

The exhibit on the next page walks through how a typical international transaction may look when funds need to move from a U.S.-based Bank (i.e. Alpha Bank in the illustration) to an India-based Bank (i.e. Beta Bank). In this example, Alpha Bank is a mid-size bank with no presence in international markets. However, the company sends the funds to HSBC, its domestic correspondent bank. The exhibit below assumes that HSBC, moreover, does not have a banking license in India and thus cannot operate in the market. Instead, HSBC transfers the funds to its correspondent bank in India, Citi. Citi withdraws funds from HSBC's correspondent account and routes the funds to Beta Bank, the India based bank.

Yet another bank – hypothetically Deutsche Bank – then handles the FX conversion between USD and INR as the examples assumes the bank is a big provider of liquidity in both currencies. Finally, banks send international interbank messages about the transaction (including settlement notification) using SWIFT codes (the Society for Worldwide Interbank Financial Telecommunication).

Correspondent Banking: a Closer Look

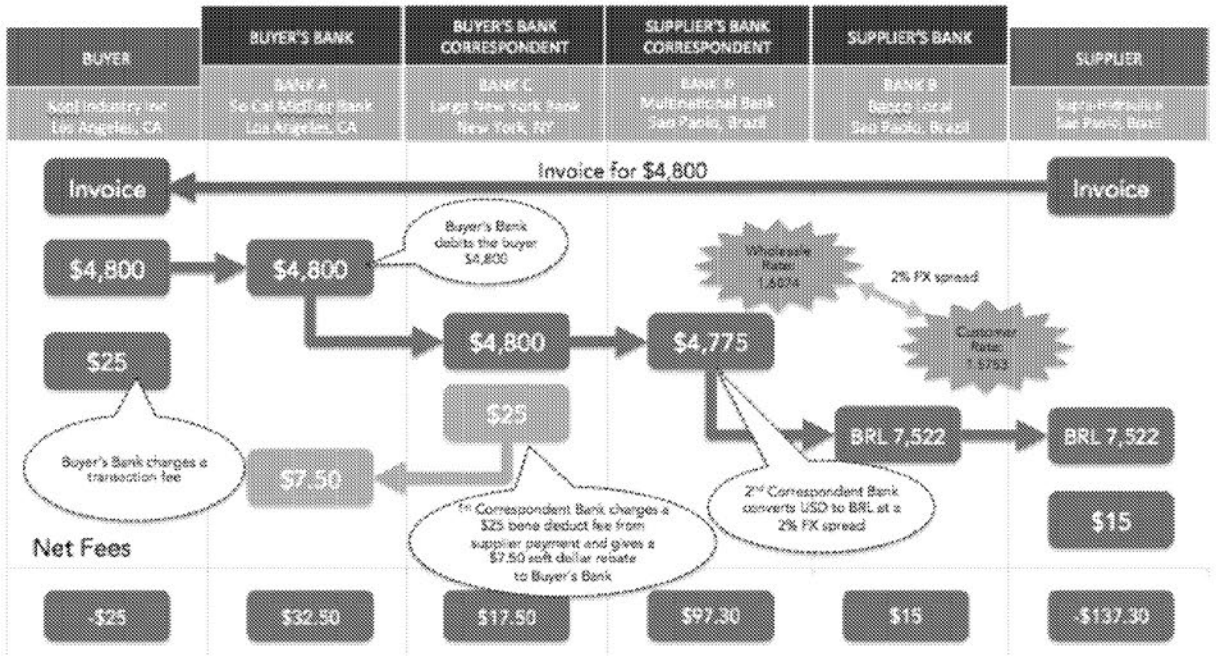


As discussed previously, this sequential process has significant costs to banks, which in turn helps set retail prices paid by bank customers (consumers and businesses). The funds can move through numerous hops, with each hop introducing a nominal fee per transaction, counterparty risk and settlement delays. Additionally, the FX conversion fees could be costly and operationally challenging. For example, HSBC needs to hold a significant amount of FX and has to rebalance in order to provide liquidity in multiple currencies. Additionally, each bank needs to have a certain amount of deposits in its correspondent banks as part of the arrangement. This "liquidity cost" varies widely depending on the bilateral arrangement and size of banks. These costs and reserve requirements add up across billions of transactions.

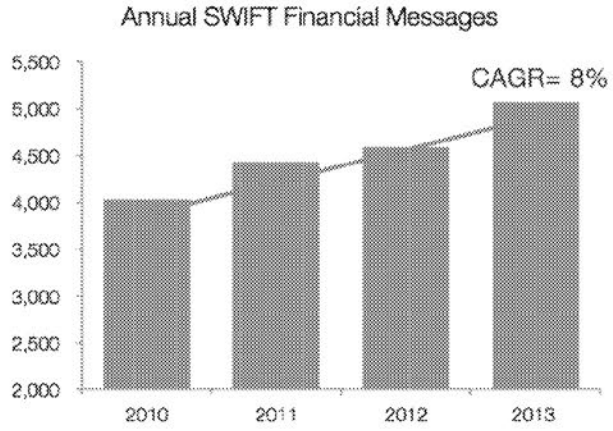
The exhibit below is a helpful illustrative example of how these costs could add up (developed by Glenbrook). The exhibit walks through how a U.S.-based business (Kool Industry) pays its Brazil-based supplier (Supra-Hidraulica) via a network of correspondent banks. As depicted on the diagram, this transaction could impose significant transaction fees and FX conversion fees (in this case the 2% FX spread) for business. This funds transfer system imposes significant costs over the billions of cross-border transactions. In 2013, for example, over 5 bn financial messages were sent over the SWIFT network (the leading provider of international interbank financial messages), with 50% of the messages representing cross-border payments.

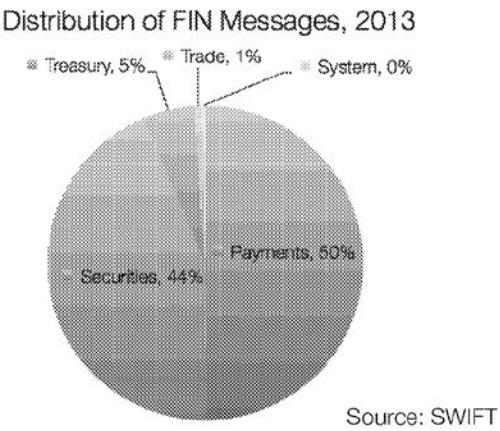
Correspondent Banking: a Closer Look

Correspondent Banking: Example



Source: Glenbrook





Source: SWIFT

The costs of correspondent banking, moreover, are likely to rise given increased regulatory requirements. According to SWIFT, while correspondent banking and payments processing remains an attractive business, increased regulation and increased competition are putting pressure on industry profits. In a May 11, 2014 article, moreover, the Wall Street Journal (WSJ) reported that JP Morgan was reviewing many of its domestic correspondent-banking relationships. According to the WSJ, JP Morgan's review was prompted by heighted regulatory scrutiny, which has encouraged the bank to shore up its risk controls. While this review appeared specific to domestic correspondent bank relationships, the intense regulatory scrutiny could have important implications for riskier international correspondent banking networks.

Correspondent Banking: a Closer Look

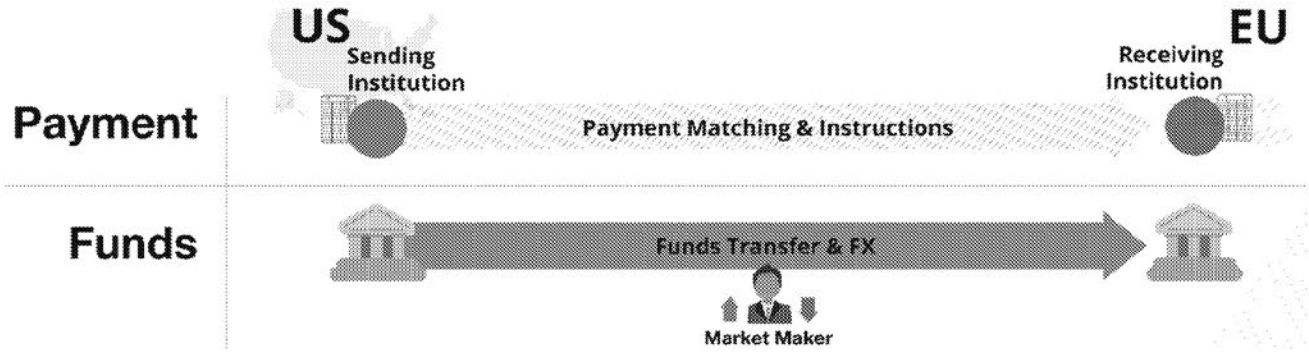
Correspondent banking also introduces numerous risks. While the examples above showed a simple illustration of two correspondent bank networks, some situations might be more complex. For example, an interbank transfer from mid-sized U.S. bank to a to India might involve three correspondent bank relationships. If one bank within the correspondent banking network were to delay a payment, it would be difficult for businesses and banks to track the funds.

When such payment delays occur, banks need to redirect staff and resources to solve these issues. As a result, financial institutions seek to minimize the rate of intervention and rate the efficiency of a payments system by a measure known as the straight through rate (i.e. the percentage of transactions that go through without intervention).

And of course, counterparty risk exists while transactions are in flight. While it is a remote possibility, it can be a big problem if a correspondent bank were to fail to make a payment. This is referred to as Herstatt Risk, coined after the German bank that failed in 1974 after it was unable to cover its liabilities.

Ripple addresses the inefficiencies in the interbank funds transfers as its decentralized network offers a low-cost, instant settlement system. There are several reasons driving financial institutions to use correspondent banking networks but one key factor is the difficulty in communicating between banks directly. Each bank has its own core account ledger, which cannot easily communicate with another bank's ledger.

In the Ripple Protocol, there is one shared ledger that other systems can plug into in order to communicate with each other. By handling transaction clearing and settlement through its decentralized network, Ripple's technology eliminates the need for multiple hops between regional bank systems. This enables settlement of transactions within 6 seconds.



Electronic Payments: a Closer Look

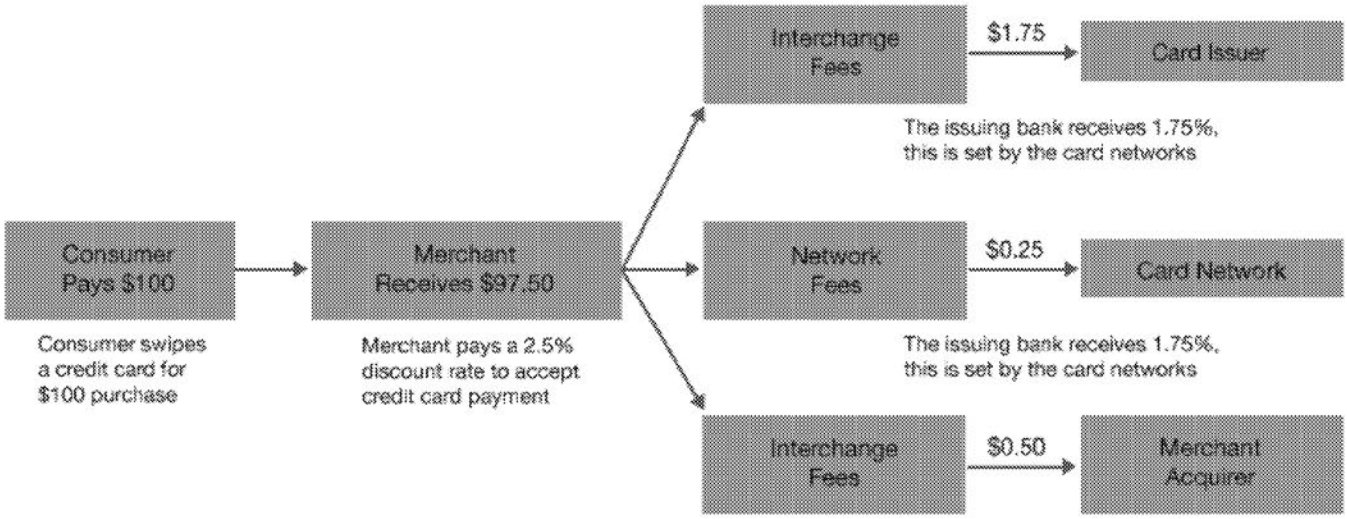
A Closer Look at Electronic Payments

Payments are perhaps the most widely used applications of interbank funds transfers. In a typical open-loop payments system (i.e. a Visa or MasterCard) funds move from a cardholder's bank (i.e. the card issuing bank) to merchant's bank (i.e. the acquiring bank). Visa and MasterCard (1) provide the rails for funds to move, clear and settle much faster than ACH, (2) set network rules that govern membership, security, and other practices, and (3) set fees for belonging to the network.

In the current payments ecosystem, merchants pay a fee for accepting electronic payments called the merchant discount rate (MDR). This MDR is typically expressed as a percentage of purchase volume and a per transaction fee. These fees vary widely depending on factors such as merchant size, type of merchant and risk of transaction (i.e. card not present are higher than card present transactions). However, in the U.S., merchants pay an average of 2.5% for physical retail payment and 3.0% or higher for online retail payments.

In an open-loop payment system, the MDR is composed of three major components: interchange (revenue for banks), network fees (revenue for payment networks) and merchant acquiring fees (revenue for payment processing intermediaries known as merchant acquirers). Merchant acquirers are responsible for charging merchants the MDR, routing the interchange component to issuing banks and paying some of network fees to payment networks (typically 60%-70% of network fees). Banks also pay network fees out of their interchange revenue (typically 30%-40% of network fees). The interchange fees and network fees are typically set by the payment networks, while the merchant acquiring fees are competitively set.

The following exhibit is a simplistic representation of how the payments economics of a typical credit card transaction are divided among key payments participants.



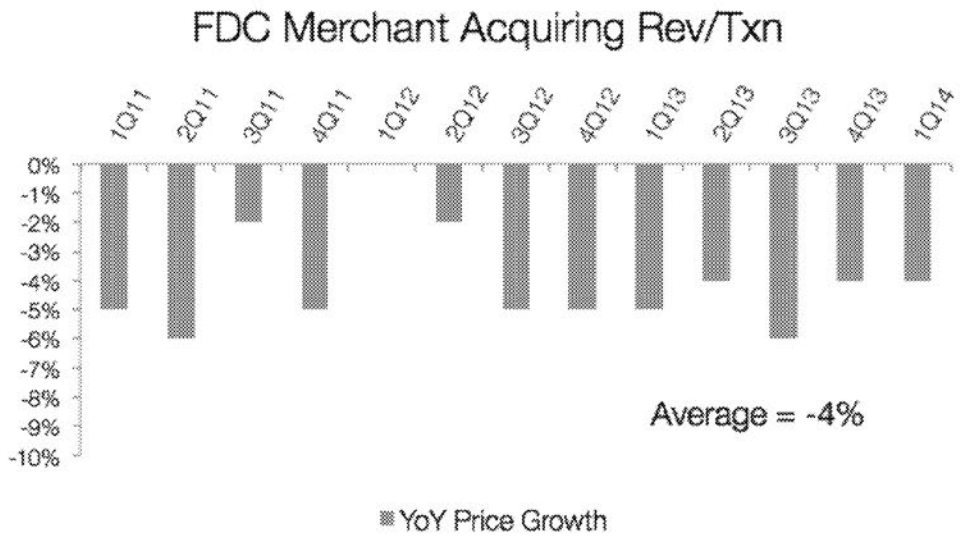
Electronic Payments: a Closer Look

The Ripple Protocol could theoretically eliminate some of these fees, resulting in lower wholesale costs of payments for banks and payment processors. However, the protocol does not set retail payments prices nor determine how Ripple users interact with each other outside of the Ripple network. In addition, since users are not required to transact in XRP, consumers and merchants can continue transacting through their local currency. As a result, consumers and merchants do not need to change their behavior or preferred method of payment.

The payments ecosystem could theoretically continue to work with current payment network rules and existing pricing, though this would require payment networks, banks and merchant acquirers to integrate into the Ripple network.

Conversely, banks and payment processors could leverage Ripple's technology to lower their direct cost of payments (i.e. reducing 0.25% paid to network fees). This could add up to meaningful costs savings for banks and payment processors handling millions or billions of purchase volume. Companies would then have the option to hold onto the higher margins or pass on the cost savings to customers.

Payment processors, such as merchant acquirers, could gain an edge on pricing over the competition with Ripple. The merchant acquiring industry remains highly competitive, particularly in the mature and fragmented U.S. market. The industry's pricing outlook has turned increasingly as new entrants have introduced a wide range of new mobile payments/loyalty applications tied to simple pricing. The chart below looks at the normalized merchant acquiring revenue per transaction growth for First Data, the largest global merchant acquirer.



Source: First Data

Electronic Payments: a Closer Look

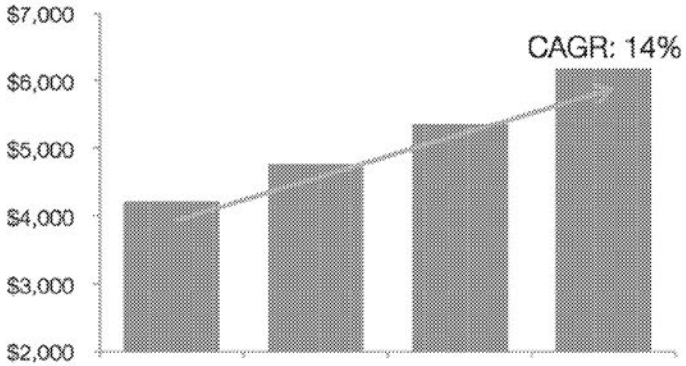
This is in contrast to other digital currencies, such as Bitcoin, which require users to transact in BTC and thus circumvent the issuing and acquiring banks entirely. As a result, the Bitcoin protocol could theoretically eliminate the entire MDR for merchants, as there is no need for an issuer, payment network or traditional merchant acquirer (although in practice Bitcoin payment processors essentially replace the traditional merchant acquirer's role). However, this forces consumers to pay fees for currency conversion to and from BTC. In addition, the Bitcoin protocol potentially gives the pricing leverage to Bitcoin payment processors, which do not pay a MDR and decide how much of the cost savings to pass onto merchants.

The benefits of Ripple's clearing and settlement system are more pronounced for international transactions. Banks and payment processors would benefit from Ripple's competitive FX rates and real-time settlement. These benefits could also be passed down to end customers who often have to pay extra cross-border fees for international transactions. For example, merchants get charged an extra 40bps to 50bps on average for accepting cards issued by a foreign bank (i.e. an international transaction) and cardholders get hit with a currency conversion fee as well.

Cross-border fees are a lucrative business for payment networks. The exhibit below shows how cross-border revenues have been growing at a rapid clip since the downturn (at about a 14% CAGR[5] from 2010-2013) and account for nearly 25% of Visa and MasterCard's combined revenue. Given the high incremental margins of these transactions, moreover (likely in the 80%-90% range), cross-border volume likely makes up over 30% of combined profits for the payment networks. While this is already a significant cost for merchants, it likely will continue to grow as a function of international travel.

By reducing FX conversion fees and cross-border network fees, Ripple could deliver significant cost savings for banks, payment processors and merchants, while enabling real-time transaction settlement.

Visa and MasterCard Cross-Border Revenues (USD, millions)



Source: Company Filings

[5] Compound Annual Growth Rate: The year-over-year growth rate of an investment over a specified period of time.

International Money Transfers: a Closer Look

A Closer Look at International Money Transfers

International money transfer is another widely used application of interbank funds transfers. Money Transfer Operators (MTOs), such as Western Union or MoneyGram rely on a collection of correspondent banking networks to transfer payments abroad. In other words, when a consumer walks into an agent and sends money to her family in Ghana via a money transfer network, that cash is ultimately getting transferred through the money transfer network's correspondent banking relationships.

Money transfer systems thus bear similar costs, risks and settlement delays that exist in international bank fund transfers. As a result, the family receiving remittances have to wait several days to have access to the cash unless the sender is willing to pay a premium for faster settlement. In contrast to electronic payments (discussed above) where merchants bear the cost of payment acceptance, however, consumers are charged money transfer fees directly.

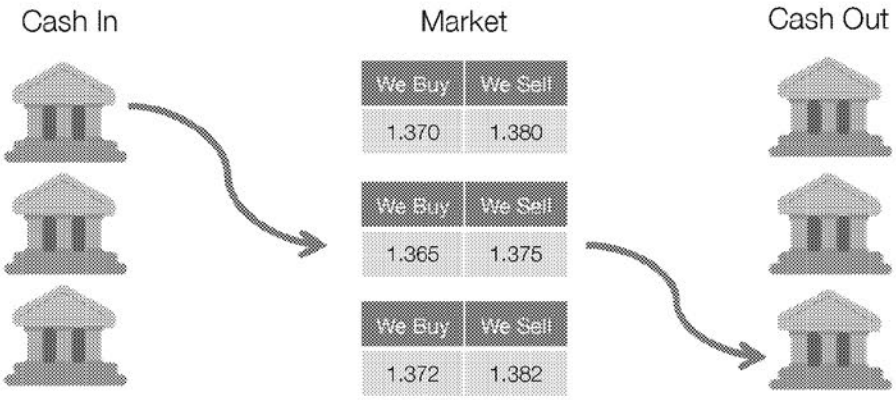
Nearly all money transfer systems could be broken out to six major components: payment gateways (i.e. cash-in and cash-out agents), Transaction Clearing and Settlement, FX Services (for international transactions), Transaction Communication, Messaging, and Dispute Resolution and Standards. As shown by the exhibit below, money transfer network operators bundle these services and charge a fee to consumers for facilitating money transfers. These fees incorporate the cost of interbank funds transfers.

The Ripple network unbundles these money transfer components and allows each function to compete on price. As discussed above, Ripple powers a quicker back-end settlement system than that offered by correspondent banking and allows FX traders (i.e. market makers) to compete for transactions (as shown in the exhibit below). This means that Ripple could lower some of the operational costs and FX spreads for money transfer networks as well as improve their consumer's experience by providing them with real-time settlement.

As a result, Ripple could drive down the wholesale cost of remittances for money transfer operators. Since Ripple does not govern retail prices, moreover, money transfer operators could have the flexibility to choose

International Money Transfers: a Closer Look

how much of the cost savings to pass down to their consumers. This could be a significant competitive edge for money transfer networks, given how fragmented the remittance market is today.



In the current money transfer ecosystem, consumers pay MTOs a fee that varies widely by a number of factors including type of remittance, amount of face value and speed of settlement. Based on World Bank data, consumers pay roughly 8% of total amount transferred, on average. These fees are used to cover agent commissions, FX conversion fees, fees related to their correspondent banking relationships and other operational costs.

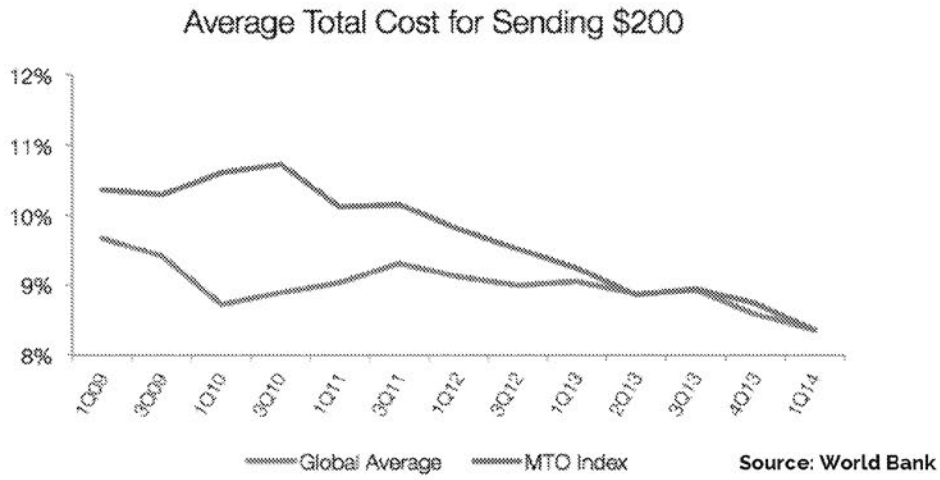
However, this fee has contracted significantly in the last five years, particularly for traditional MTOs. The exhibit below illustrates how the premium pricing charged by MTOs over the global average price of remittances has virtually eroded. In fact, the average price charged by MTOs reached the lowest level on record and finished slightly lower than the global average price in 1Q14.

While competition has been steadily intensifying between traditional MTOs, banks and non-traditional participants (such as retailers and telcos), the biggest change in the competitive landscape is the emergence of online and mobile money transfer companies.

These new providers leverage the Internet and have formed relationships with banks to enable bank-to-bank transfers and circumvent some of the fees involved in mobile money transfers, such as agent commissions.

As a result of this cost advantage, online and mobile money transmitters generally charge consumers a more competitive rate. In addition, rising regulatory requirements have increased operating costs for MTOs. Thus far, competitive pressure has prompted the leading MTO, Western Union, to lower prices significantly in select corridors. However, competition is likely to intensify and MTOs will continue to balance the need to offer more competitive pricing while maintaining healthy margins.

International Money Transfers: a Closer Look



Ripple's technology could help lower the cost of money transfer networks by removing the need to maintain an extensive correspondent banking network and offering competitive FX rates. As noted above, the Ripple protocol does not govern retail prices and thus money transmitters can choose how much of the potential cost savings to pass onto their end consumers. At the very least, however, the lower cost could provide MTOs with the flexibility to lower prices to compete with new entrants.

Potential Risks

What are the Risks to the Ripple's Success?

Despite the key benefits of Ripple, there are also numerous risks that that potential users and potential XRP investors should consider.

Regulation Remains Unclear

As with other settlement protocols which involve a digital currency, regulatory uncertainty remains a big hurdle for wide adoption of Ripple. Regulators in the U.S. and abroad are increasingly taking steps to understand, contextualize and regulate digital currencies. As a result, it is still unclear how regulation will ultimately look and how burdensome it will be on digital currency protocols and users.

Though the Ripple protocol is very different from other digital currency protocols, it is unclear whether regulation will distinguish between protocols or regulate all digital currencies under one broad brush. On a similar note, Ripple could suffer from reputational damage if other digital currencies are used for illicit activities or operators/exchanges for other digital currency protocols are engaged in unlawful behavior.

Additionally, while Ripple makes it easier to track the flow of funds within the network, it is hard to identify individual account holders in isolation. While Ripple Labs is continuing to innovate and add features that could make it easier to identify account holders to help law enforcement, it will need to balance this with ensuring user privacy protection.

Ripple is a Nascent, Relatively Illiquid Network

Needless to say, the Ripple network is nascent and volume will gradually build as more banks, gateways and market makers integrate into the network. Much of the appeal of the network, including the ability to send money anywhere in the world and to leverage FX trading competition hinges on building out significant volume on the network. In addition, despite stress testing in "laboratory conditions", there is some uncertainty on how the network will perform when volume spikes in heavy traffic seasons. While these are issues that could get resolved over time, users must be aware of liquidity risk before transacting on the network today.

Competition Could Intensify

While Ripple focuses on forming industry partnerships with banks, payment processors and money transfer transmitters, it is possible that some incumbents could decide to compete with the protocol. Direct competition could entail incumbents creating their own digital currency protocol or deciding to integrate/partner with other existing digital currencies (i.e. Bitcoin, Litecoin, etc…).

Finally, while incumbents may not opt to either adopt other digital currencies or create their own, influential incumbents may enact policies that make it difficult for others in the ecosystem to use Ripple.

Potential Risks

Existing Networks Could Get Upgraded

The existing settlement architecture could be made faster. An upgrade to "same day ACH" in the U.S. could make more significant changes like Ripple appear less attractive. Likewise, some limited form of "global ACH" could get adopted to smooth pain points in international payments.

However, the Federal Reserve, in a series of recent Payments Town Halls, has indicated that it would prefer a more comprehensive solution to modernize the payments system. And any upgrade to ACH can be expected to take many years to implement, giving Ripple some time to gain traction.

Technological Flaws Could Exist

While the underlying source code has been public and available for public audit since September 2013, it is possible that technological flaws could be discovered in Ripple's consensus or other processes. While it may be possible to fix a bug, the reputational damage could still be significant.

It is difficult/impossible to definitely prove that something is fully secure. The absence of security breaches over a long period of time is usually the best evidence that a system is trustworthy. In this sense, trust in the Ripple protocol may partially be a function of time.

The Protocol Could Be Forked

Since the code for Ripple is totally open-source, a third party could clone and re-brand Ripple (i.e. "fork" the protocol), potentially garnering more adoption and the associated positive network effects. The Bitcoin protocol has seen a large number of clones (Litecoin, Dogecoin, etc.), all of which are essentially copies of the Bitcoin code base, with small changes that are often largely cosmetic in nature.

Because the Ripple protocol relies on integration with gateways and financial institutions, it is more complicated to effectively clone Ripple than it is to clone Bitcoin. Copying the code is easier than convincing third parties to integrate and support it.

Likewise, though Bitcoin has been extensively copied and rebranded, the original implementation continues to enjoy the most adoption and positive network effects.

A Superior Protocol Could Be Developed

It is possible that someone will develop a superior protocol for funds transfer and settlement, potentially offering faster settlement, better ease of use, or features that have yet-to-be considered.

Conclusion

Ripple Protocol: The Internet for Value

The Ripple protocol aims to link the financial world on a common system for transaction settlement. A global Internet for value transfer can create economic efficiencies that are as significant as those brought about by the Internet for information. Ripple's technology enables users to transfer funds (including fiat currencies, digital currencies and other forms of value) across national boundaries as seamlessly as sending an email.

A Compelling Alternative to Correspondent Banking

As a result of its key features, the Ripple Protocol presents a compelling alternative to traditional interbank funds transfer systems. Given the absence of an international payment rail, international interbank funds transfers rely on a series of correspondent banking networks which introduce multiple layers of fees, counterparty risk and settlement delays. The Ripple Protocol eliminates the costs associated with correspondent banking as it enables two banks located anywhere in the world to transact directly on a real-time basis. Market makers can compete on Ripple to provide liquidity for global payments. By introducing new market participants and making foreign exchange pricing a competitive process, the cost of sending payments can improve meaningfully.

Partnerships are Key

Ripple sits at the bottom of the payments stack, providing settlement functionality to banks, money transmitters, and other financial services institutions. This approach stands in contrast to other peer-to-peer networks, most of which seek to disintermediate existing players. The Ripple Protocol is not built to interface directly with consumers and businesses and does not govern retail prices. Thus, the Protocol provides financial institutions with the flexibility of passing on some of the cost savings to their end customers (consumers and businesses) while managing profit margins.

The Role of XRP

XRP is the native currency of the Ripple protocol. It is a digital asset, like Bitcoin, though most users of Ripple will continue to use their existing local currencies. XRP plays a security function and assists with liquidity providing on the network. Over time, if the Ripple protocol becomes widely adopted, demand for XRP may increase, leading to an increase in price. Unlike information protocols like HTTP or SMTP, investors can directly own a stake in Ripple, the value transport layer of the Internet.

Distributed Systems: The Future of Finance

Most of the world's payment systems still operate on infrastructure that was designed in the 1950s – 1970s. Recent technological innovations have made it possible to clear and settle transactions without involving a third party agent. This has opened the door to move finance to a post-Internet, distributed architecture. Incumbent players broadly acknowledge the inefficiencies in the current payments process and seek a solution. Ripple provides a free, neutral, and global solution to move payments into the Internet age.

Additional Resources

Ripple Homepage - https://ripple.com
Ripple Labs Homepage - https://www.ripplelabs.com
Ripple Primer (Market Making) - https://ripple.com/ripple-mm.pdf
Ripple Gateway Primer - https://ripple.com/ripple-gateways.pdf
Ripple Wiki - https://ripple.com/wiki/
Create an Account on RippleTrade - https://www.rippletrade.com/#/register
Ripple GitHub Repository - https://github.com/ripple/
Ripple server code - https://github.com/ripple/rippled
Ripple Developer Portal - https://dev.ripple.com/
Consensus - https://ripple.com/wiki/Consensus

Contact

Authors

Phillip Rapoport
Head of Markets and Trading
Email: [redacted]@ripple.com

[redacted]
Fmr. Goldman Sachs Payments Analyst
Email: [redacted]gmail.com

Patrick Griffin
EVP, Head of Business Development
Email: [redacted]@ripple.com

[redacted]
Business Development
Email [redacted]@ripple.com

[redacted]

Editing and Design
Email: [redacted]@ripple.com

Partnership Inquiries

Email: [redacted]@ripple.com
Phone: [redacted]

Address:

Ripple Labs
300 Montgomery Street, 12th Floor
San Francisco, CA 94104
U.S.A